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Immediate Water Pollution Control Needs, Corpus Christi Bay Area, Texas

Federal Water Pollution Control Administration, Dallas, Tex

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PB 266 389

IMMEDIATE WATER POLLUTION CONTROL NEEDS

CORPUS CHRISTI BAY AREA

TEXAS

U. S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
SOUTH CENTRAL REGION
DALLAS, TEXAS 75202

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16. ABSTRACT

The purpose of the report is to focus attention on known sources of water pollution in this area and to provide a priority for action to correct existing problems and to prevent future problems.

17. KEY WORDS AND DOCUMENT ANALYSIS

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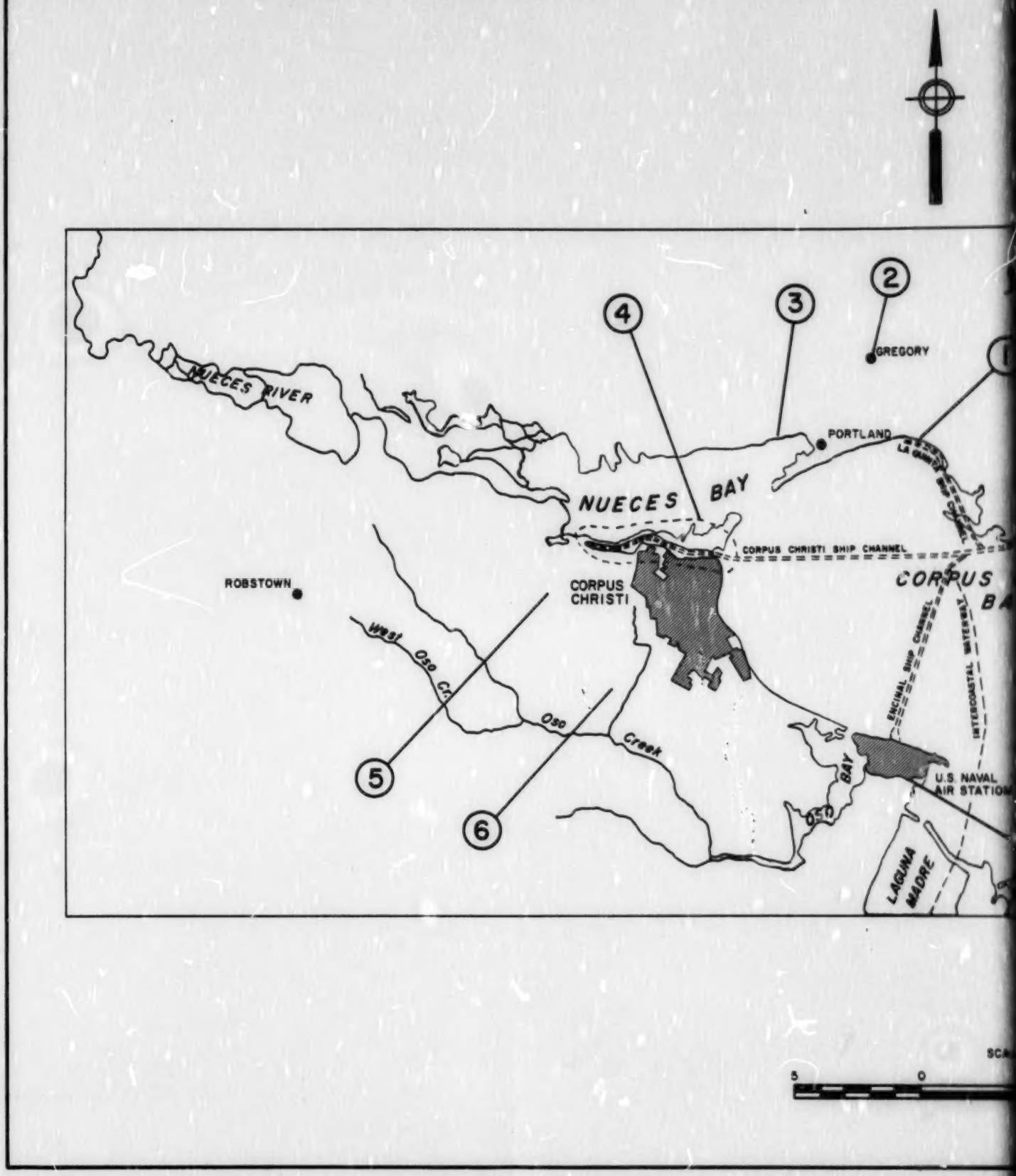
I. Introduction

The purpose of this report is to focus attention on known sources of pollution and to provide a priority for action to correct the existing water pollution problems and prevent future problems in the Corpus Christi Bay Area (see Figure 1), a portion of the coastal waters of the State of Texas. This report is based on compilations of available data of the Federal Water Pollution Control Administration, South Central Region, the Texas Water Pollution Control Board, and other agencies of the State of Texas. No detailed water quality surveys or engineering studies were carried out for the preparation of this report.

The findings of this report are based on the best information available at this time on water quality conditions and immediate and potential pollution abatement needs. The omission of any particular town, industry, or other establishment from this report does not imply that an immediate or potential pollution abatement need does not exist in that particular area. Priorities listed are based solely on an evaluation of the Corpus Christi Bay Area and not on a relative basis with other basins in the South Central Region.

Authority is given in Section 3 (a) of the Federal Water Pollution Control Act, as amended, for the preparation or development of comprehensive programs for eliminating or reducing the pollution of interstate waters and tributaries thereof and improving the sanitary conditions of surface and underground waters. This report, by describing the immediate needs for controlling water pollution in the Corpus Christi Bay Area, represents the first step in the development of a comprehensive program to control water pollution in this area.


NUECES RIVER
GREGORY
PORTLAND
NUECES BAY
CORPUS CHRISTI SHIP CHANNEL
ROBSTOWN
CORPUS CHRISTI
Oso Cr.
Oso Creek
BAY
U.S. NAVAL AIR STATION
LAGUNA MADRE
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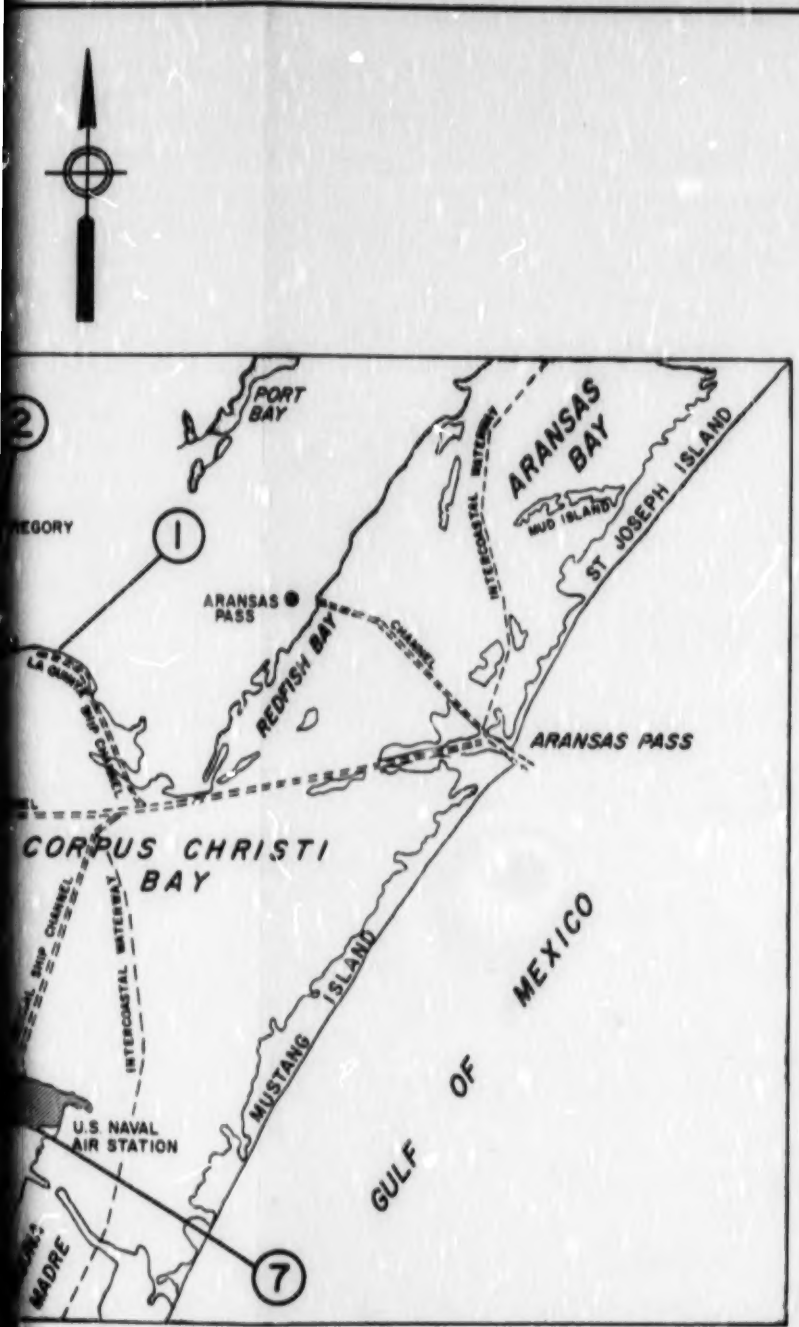

VICINITY MAP

LEGEND

(2) NEEDS

SCALE IN MILES

0 5 10 15

IMMEDIATE WATER POLLUTION CONTROL NEEDS
CORPUS CHRISTI BAY — TEXAS

LOCATION MAP

UNITED STATES DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration
SOUTH CENTRAL REGION APR. 1967 DALLAS, TEXAS

FIGURE 1

II. Summary of Immediate Pollution Control Needs

Pollution problems in the Corpus Christi Bay Area indicated by diminishing commercial fish harvest, localized oxygen depletion and salinity concentration, and sporadic appearance of algae and odors result in damages to propagation of fish, industrial and cooling water supply, and recreation uses. The immediate pollution control needs are listed in the following tabulation grouped into categories: waste treatment, institutional practices, and research. Location designations refer to Figure 1.

Location	Responsibility	Need	Priority
Waste Treatment			
Corpus Christi Bay			
2	City of Gregory, Texas	Chlorination	B
1	Reynolds Metals Co., near Portland, Tex.	Settling and biological treatment	B
7	Corpus Christi Naval Air Station, Texas	Improvement modification of sewage treatment plant	A
Nueces Bay			
3	Coast Guard - Corpus Christi Depot, Tex.	Add secondary treatment	B
Corpus Christi Ship Channel			
4	City of Corpus Christi, Texas (Broadway Plant)	Expansion of treatment facilities for growth	B
	Southwestern Oil & Refining Co., Tex.	Stripping and biological treatment	A
	Pontiac Refining Corporation, Tex.	Stripping of dissolved gases	A
	Delhi-Taylor Oil Corporation, Tex.	Settling and biological treatment	A

Location	Responsibility	Need	Priority
Waste Treatment (continued)			
Corpus Christi Ship Channel (continued)			
4	American Smelting & Refining Co., Tex.	Replacement of sewage treatment facilities, settling & removal of metals from industrial waste	A
	Corn Products Co., Texas	Primary and biological treatment	A
	Suntide Refining Co., Texas	Neutralization, primary and biological treatment	A
Oso Bay			
6	City of Corpus Christi, Texas (Westside Plant)	Expansion of treatment facilities for growth	B
5	Celanese Chemical Company, Texas	Settling facilities	A
7	Corpus Christi Naval Air Station, Tex.	Collection system and industrial waste treatment plant	A
Institutional Practices			
Corpus Christi Bay			
	State of Texas	Officially adopt use designations for the various waters of the Corpus Christi Bay system in order to clarify water quality requirements for the individual areas, particularly the man-made channels such as the landlocked portion of the Corpus Christi Ship Channel	B
	State of Texas	Proceed to adopt water quality standards for the Corpus Christi Ship Channel	B

Location	Responsibility	Need	Priority
Institutional Practices (continued)			
	State of Texas	Provide additional personnel for surveillance of the water quality of the Corpus Christi Bay system and of the various discharges to the system	B
	State of Texas	Consider legislation to provide appropriations for state participation in grants for construction of sewage treatment works	B
	State of Texas	Prepare and maintain a complete industrial waste discharge inventory for industries not connected with municipal treatment systems	B
Special Studies and Research			
	State of Texas	Institute a complete compilation of all data obtained from previous general and specific studies of the Corpus Christi Bay system	B
	State of Texas	Carry out a complete study of the Corpus Christi Bay system in order to fully delineate the various factors affecting the quality of the waters of the Corpus Christi Bay system that have not been completely evaluated in previous studies	B
	Federal Government, State and Local Governmental Agencies, Institutions of Higher Learning, etc.	Initiate correlated research on the control of salinity and nutrient buildup in shallow bay systems	B

III. Immediate Control Needs

Immediate pollution control actions in the Corpus Christi Bay area are needed more for preventing future pollution problems than for correcting existing pollution problems. Various actions are necessary to keep pace with the growth of the area and prevent the creation of pollution problems. The only material degradation in water quality has been in the landlocked portion of the Corpus Christi Ship Channel. Water quality of the Ship Channel is generally acceptable for the present uses of navigation and industrial cooling but it is so poor that other more discriminating uses are prevented. The low quality water also represents a potential hazard to current and future uses of Corpus Christi Bay.

Waste Treatment Improvement Needs

In general, the highest priority should be placed on the upgrading of the quality of the effluents discharged to the Corpus Christi Ship Channel. This upgrading applies primarily to the industrial discharges, since the municipal sewage already receives primary and secondary treatment and chlorination prior to its discharge.

As the Corpus Christi Bay area grows, it will be necessary to expand the municipal sewage treatment facilities. The need for such expansion will depend on the rate of growth and on the character and location of the future growth. The expansion of several municipal sewage treatment plants is included in the needs for waste treatment improvements but at a lower priority (Priority B) than the improvements mentioned above.

Institutional Needs

The designation of optimum uses and the establishment of water quality standards for the waters of the Corpus Christi Bay system require official action by the State of Texas in the near future. The official designation of the uses and quality standards will aid materially in the present pollution control activities and the planning of future activities. It is understood that the State of Texas is taking these actions.

To strengthen the state's position on prevention, control and abatement of stream pollution, water quality standards are needed on intrastate streams. State participation is needed in the waste treatment plant construction grants program to accelerate the construction of needed improvements. Increased surveillance and operation inspection of sewage and industrial waste treatment plants are needed to locate and identify existing or potential serious

pollution problems. For more rigid control over industrial pollution and aid in solving complex stream quality problems, a complete and up-to-date inventory is needed of industrial waste discharges to basin streams, listing quantity and quality of effluent and other pertinent data.

Special Studies and Research

A number of special studies of the Corpus Christi Bay system have been made by Federal, State, and local governmental agencies as well as by private groups. The results of these studies need to be compiled and collated. Pursuant to this the State of Texas, with the cooperation of Federal and local governmental agencies and private interests, should evaluate existing and proposed methods of pollution control and apply the most appropriate method to control and prevent pollution in the Corpus Christi Bay system.

An overall need is the evaluation of the various factors governing the salinity and nutrient buildup in shallow bay systems. While this need applies to most of the bay systems along the Gulf Coast and not to Corpus Christi Bay alone, a correlated research program directed toward defining the general parameters that describe the buildups would be quite valuable in the future control of the quality of the Corpus Christi Bay system.

This list of needs is not considered all inclusive and does not reflect the ultimate in precision and detail in evaluating alternatives. It does not reflect projected needs due to future obsolescence or to expanded or changed water uses. The actions recommended here are, however, prerequisite to good water quality planning and should be included in local and State programming for water pollution control. Background for these immediate needs is summarized in Chapter VI.

IV. Cost of Immediate Pollution Abatement

Waste Treatment Improvement Costs

Municipal Waste Treatment Facilities - It is estimated that $6,000,000 will be needed for improvements at five sanitary waste treatment facilities in the Corpus Christi Bay area.

Industrial Waste Treatment Facilities - It is estimated that $4,000,000 will be needed for improvements at nine industrial waste treatment facilities in the Corpus Christi Bay area.

The total estimated costs for expansion and improvements of treatment facilities in the Corpus Christi Bay area is $10,000,000.

Operating Costs

As the improvements are made, it will be necessary to provide additional personnel for the operation of the treatment units. These personnel will be primarily involved in the operation of new or expanded facilities serving industrial plants. It is estimated that the additional operating personnel cost will be approximately $100,000 per year. Other operating costs are estimated at $188,000 per year bringing the total additional operating costs to approximately $288,000 per year.

Pollution Surveillance Costs

It is estimated that the pro rata share of the cost of additional pollution surveillance of Corpus Christi Bay as part of a regional organization will be $30,000 annually.

Special Studies and Research Costs

It is estimated the compilation and collation of existing data will cost approximately $30,000. An overall survey and evaluation of the various parameters which are needed for pollution control in the Corpus Christi Bay system is estimated to cost in the neighborhood of $300,000.

No estimate has been made of the cost of the overall research on salinity and nutrient buildup in shallow bay systems.

V. Recent Progress in Pollution Control

The Texas Water Pollution Control Law (Article 7621d, Vernon's Civil Statues) was passed in 1961 and became fully effective in November 1962. This law requires permits for the discharge of any waste waters that may cause pollution. At present, administration of the law is carried out under a seven man Water Pollution Control Board (WPCB).

The law provided for the issuance of statutory permits to continue discharges existing at the time of its passage. After its initial effort to inventory all existing waste discharges, the major effort of the WPCB has been expended in three areas. These have been Galveston Bay area, oil field brines throughout the state, and localized problem areas.

Formal actions by the Texas WPCB in the Corpus Christi Bay area have involved actions on individual permits for new installations and voluntary amendment of requirements for existing installations. An active program for securing voluntary improvements is being carried forward through efforts of the Texas State Department of Health and the Corpus Christi-Nueces County Health Department.

The voluntary program has resulted in the construction of two new sewage treatment plants and expansions or improvements of two other sewage treatment plants. The new construction and improvements have resulted in the reduction of loading on existing treatment plants and the elimination of a number of individual household and small industrial discharges. The voluntary program has also resulted in improvements in the waste treatment facilities of at least three industrial plants.

VI. Background for Recommendations

General Basin Characteristics

Location: Corpus Christi Bay is a landlocked bay system off the Gulf of Mexico on the midsouthern coast of Texas at approximately latitude 27° 15' and longitude 97°45'. The overall bay system consists of three contiguous bays designated as Corpus Christi Bay, Nueces Bay, and Oso Bay. The system is joined on the north by Redfish Bay, on the south by Laguna Madre, and to the Gulf of Mexico by Aransas Pass.

Uses: The Corpus Christi Bay system is used for recreational purposes, including boating, fishing, swimming, and water sports. Some 57 species of fish were reported for the bay system in 1961. At present 426,000 pounds of bait shrimp are produced annually which will support about 1,280,000 man-days of sports fishing effort.

Commercial fisheries have yielded about 600,000 pounds of products for the past six years with a downtrend from 945,000 pounds in 1960 to 315,000 pounds in 1963. For the past six years, fish have averaged 36.1 percent of the products, oysters 12.3 percent, blue crabs 1.3 percent, and shrimp 50.3 percent. However, probably due to dredging operations in the bay, oyster production contributed little to the total fishery products at the present time. It is also probable that the shrimp production represents only a small portion of the total shrimp harvest since most shrimp are harvested in the Gulf of Mexico. The Gulf production is not included in that of Corpus Christi Bay, although the shrimp may have migrated from the bay.

Some industrial water is removed from the bay and its arms. While there may be some limited process use, this water is used primarily for cooling purposes and returned to the bay system.

Several navigation channels have been cut through the bay, opening it to navigation by ocean going vessels through the Corpus Christi Ship Channel and to barge traffic through smaller channels.

Nature of the Bay System

General: Corpus Christi Bay is separated from the Gulf of Mexico by Mustang Island. Aransas Pass, at the north end of the island, is the prime connection of Corpus Christi Bay and the Gulf

of Mexico and is the pass used by ocean going vessels. Redfish Bay, a bay of the Aransas Bay system, joins it on the north, and Laguna Madre joins it on the south. Occasionally, at relatively high tides, water passes from the Gulf of Mexico to Corpus Christi Bay through Corpus Christi Pass and Newport Pass at the south end of Mustang Island.

Bay Area and Depth: The Corpus Christi Bay system is shallow and has a surface area of 116,000 acres. Corpus Christi Bay covers about 85 percent of the area, Nueces Bay about 14 percent, and Oso Bay about one percent. Due to the shallow, flat nature of the bay system, the surface area of water varies considerably with tidal fluctuations and wind variations.

Corpus Christi Bay has a maximum depth of 15 feet and an average depth of eight to ten feet. The average depth of Nueces Bay is between two and three feet with large areas near the shore being less than one foot in depth. Oso Bay is quite shallow, ranging in depth from a few inches to about three feet near its connection with Corpus Christi Bay. The upper end of this small bay might be more properly described as a mud flat.

Corpus Christi Ship Channel: The Corpus Christi Ship Channel begins in the Gulf of Mexico and proceeds through Aransas Pass and Corpus Christi Bay to the Port of Corpus Christi. The channel is completed to a depth of 36 feet and a width of 400 feet for the 21 mile open stretch of Corpus Christi Bay. From the bay side of the Corpus Christi turning basin, the channel is completed to a depth of 36 feet and a width of 200 feet for 8.7 landlocked miles to Viola turning basin. Four turning basins and connecting channels are located in this 8.7 mile stretch. Deepening of the channel to 40 feet is authorized. The widening of the one-mile-long Industrial Canal from the Corpus Christi turning basin to Avery Point turning basin to 400 feet is also authorized.

The Corpus Christi Ship Channel from its head at Viola turning basin to its entrance into Corpus Christi Bay at U. S. Highway 181 is completely landlocked. It is separated from Nueces Bay and the Nueces River by the spoil bank from the dredging operations.

Several smaller channels branch off the Corpus Christi Ship Channel in Corpus Christi Bay, with the two major ones being La Quinta Channel and Encinal Channel. La Quinta Channel serves the Reynolds Aluminum Complex near Gregory, while Encinal Channel serves the Corpus Christi Naval Air Station.

Tidal and Wind Exchange: The tidal variation along the entire Gulf Coast of Texas is slight, with a general maximum of 2.0 feet. The level of water in the bays and exchange of water with the Gulf of Mexico depends as much, if not more, on wind direction and velocity as it does on lunar tide variations.

The mean diurnal tide ranges from 1.7 feet at Aransas Pass to 1.0 feet at Corpus Christi. Prolonged westerly winds tend to lower the water surface in Corpus Christi Bay several feet, while prolonged easterly winds tend to raise the level by the same amount.

Fresh Water Inflow

Nueces River: The major source of fresh water flow to the Corpus Christi Bay system is the Nueces River, with its total watershed of 17,000 square miles. This river, consisting of some 446 river miles through semiarid areas, discharges to the western end of Nueces Bay. Small intermittent streams drain the local area, with the major ones of these, Oso Creek and Kinney Bayou, having a total drainage area of 200 square miles.

The average discharge of the Nueces River for the 25-year period ending with water year 1963-64 was 773 cubic feet per second (cfs). During this period the maximum and minimum discharges were 49,400 and 6.8 cfs, respectively. However, this 25-year period includes the period before completion of Westley E. Seale Dam near Mathis on April 26, 1958. Since the completion of this dam, the flows have been considerably altered. For the water year 1963-64 the mean, maximum, and minimum flows in the stream below the dam were 104, 272, and 43 cfs, respectively.

The flow in the Nueces River below Westley E. Seale Dam depends almost entirely on releases from the reservoir for municipal and industrial purposes. It is estimated that the City of Corpus Christi used an average of 46.7 million gallons per day (mgd) during the water year. This use amounted to approximately 70 percent of the average discharge below Westley E. Seale Dam, leaving relatively little fresh water inflow to Nueces Bay. At times there was probably no flow downstream from the Corpus Christi intake. Little, if any, fresh water dilution flow may be expected from this source.

Small Streams: The small streams of the area contribute flows of consequence only during rainfall periods. These streams do not furnish any sustained fresh water flow to the bay system.

Physical Problems

Evaporation: This area of Texas is semiarid. The average net evaporation rate is estimated to be 28 in. per year. During a dry year it is estimated the net evaporation rate may be as high as 45 in. There is a tendency in the shallow bays of this area for the concentration of constituents of any inflow water to increase as a result of the high evaporation rates.

Tidal Exchange: The exchange of water between the Bay and the Gulf of Mexico is not large. In effect, the net exchange over a period of time is the small amount of fresh water inflow plus the return flows from the municipalities and industries. Because of the small ratio of inflow to the total water in the bay and the relationship of the narrow inlet to the overall bay area, there is little flushing action in the bay system except during storm periods.

Area Development

Municipal: Corpus Christi Bay is surrounded by a number of small communities in addition to the City of Corpus Christi on its south shore. Only the north shore of Nueces Bay is relatively free of domestic habitation.

The City of Corpus Christi lies in Nueces County, which forms the Corpus Christi metropolitan area. This area was estimated to have a population of 219,640 in 1962. Only a small percent of the population resides outside the drainage area of Corpus Christi Bay. Other communities in Nueces County and in the watershed of Corpus Christi Bay are Robstown and Port Aransas.

Only a small portion of San Patricio County on the north side of Corpus Christi Bay drains to the bay. In this portion are the cities of Gregory and Ingleside, with combined estimated 1962 populations of 4,702.

Industrial: Most of the heavy industry is located along the south side of the Corpus Christi Ship Channel. One exception is the Reynolds Aluminum Company plant located on the north side of Corpus Christi Bay near Gregory. Smaller industrial plants, mostly of a dry nature, are scattered throughout the area, particularly in the Corpus Christi metropolitan area.

Agriculture: Nueces and San Patricio Counties are major agricultural areas, with the farms adjoining the outskirts and, in some areas, existing within the cities. The major crops are grain sorghums, truck vegetables, and cotton. Nueces County averages

50,000 to 100,000 bales of cotton per year, while San Patricio County averages about 77,000 bales. It is estimated that about 4,000 acres are irrigated in Nueces County and about 23,000 acres in San Patricio County.

Present Water Quality Problems

General

The quality of the waters of the Corpus Christi Bay system is considered to be good. The bay system does not appear to have any oxygen depletion problems. Because of the lack of problems, no overall water quality monitoring program has been maintained. However, studies for specific purposes have yielded various items of information concerning the quality of the bay system.

The waters of Corpus Christi Bay and Nueces Bay are considered to be of good quality. Significant water quality degradation has been observed only in isolated small areas in the immediate vicinity of effluent outfalls. The quality of the waters of Oso Bay and the landlocked portion of the Corpus Christi Ship Channel present special problems which are discussed more completely below.

Although the control of salinity in the bay system is not considered to be a major problem at the present time, it may become a major problem in the future. The fresh water flow from the Nueces River has been materially reduced by development of water supply lakes in the basin. As growth in this area of Texas continues, the use of water from these lakes will increase and, thus, further reduce the fresh water inflow to the bay system. The present exchange rate, although relatively low, appears to be adequate for salinity control. However, further reduction of the fresh water inflow may reduce the exchange rate to a critical point.

The Corpus Christi Bay system receives the runoff from a limited agricultural area. The nutrients and pesticides in this runoff do not appear to be causing damages to water use at the present time; however, the constituents of the agricultural runoff, like salinity, may become a problem if the exchange rate of the bay system is further reduced. In addition, the bay system receives a limited amount of oil field brine. Although no estimate of the amount of brines has been made, it is believed the amount is decreasing rapidly through depletion of the oil fields.

Corpus Christi Bay

Approximately 0.4 MGD of effluents are discharged directly to or immediately adjacent to Corpus Christi Bay by two municipal sewage treatment plants and two industrial plants. The total discharge is about 0.3 MGD of domestic effluent and 0.1 MGD of industrial effluent. The domestic sewage receives both primary and secondary (biological) treatment, while the industrial wastes receives various degrees of a veriety of treatments.

There do not appear to be any major quality problems in Corpus Christi Bay at the present time. As a standard health protection procedure, only small areas with a radius of 500 to 700 yards around outfalls are closed to commercial oyster production. Shellfish surveys by the Texas State Department of Health during July and August 1963 revealed the following data:

	Temperature °F	MPN/100ml	pH	Chlorides,ppm
Range	84-86	0-33	7.7-8.4	22,800-28,000
Apparent Mode	84	0	8.1	24,000

A shellfish report for 1966-67 indicates that the Corpus Christi Bay waters contain 0.032 ppm DDE, 0.026 ppm DDD, and 0.014 ppm DDT.

Other sources reported that the organic carbon content ranged from 4.9 to 27.9 mg/l in April 1960, and from 4.3 to 38.5 mg/l in February 1962. A phosphate content ranging from 0.9 to 5 mg/l was reported in 1964.

Corpus Christi Ship Channel

Approximately 16.2 MGD of effluent are discharged to the Corpus Christi Ship Channel by one municipal sewage treatment plant and ten industrial plants. The total discharge is about 9.9 MGD of domestic effluent and 6.3 MGD of industrial effluent. The domestic sewage receives both primary and secondary treatment, while the industrial wastes receive varying degrees of a variety of treatments. Of approximately 162 MGD of cooling water taken from the channel, 85 MGD are returned.

The prime use of the Corpus Christi Ship Channel is navigation. It is not used for recreational purposes or for either sports or commercial fishing and has historically been closed to commercial oyster production. From its prime use standpoint, navigation, the

quality of the water does not appear to be a problem. However, the water of the channel reaches Corpus Christi Bay and its quality must be kept under control in order to protect the quality of the waters in the bay.

The Corpus Christi Ship Channel acts as a buffer between the discharged effluents and Corpus Christi Bay. Central Power and Light Company operates a power plant near the mouth of the channel, which removes about 77 MGD of cooling water from the channel and discharges it to Nueces Bay. This water, drawn from both the bay end and the landlocked end of the channel, promotes mixing of the channel water with bay water prior to the discharge to Nueces Bay. In addition, the cooling water is chlorinated for slime control, which incidentally causes some additional oxidation of organic materials in the channel waters.

A summary of available water quality data for the Corpus Christi Ship Channel is as follows:

	Dissolved Oxygen, mg/l	pH	Chlorides, mg/l
Range	2.4-4.1	7.6-8.4	24,500 - 32,500

Nueces Bay

Approximately 3.4 MGD of effluents are discharged to Nueces Bay by two municipal plants and four industrial plants. The total discharge is about 0.5 MGD of domestic effluent and 2.9 MGD of industrial effluent. The domestic sewage receives both primary and secondary treatment, while the industrial wastes receive various degrees of a variety of treatments. In addition, the bay receives 77 MGD of industrial cooling water removed from the Corpus Christi Ship Channel. One small Federal installation discharges about 1000 gpd of primary treated wastes to the Bay.

The overall quality of the waters of Nueces Bay is considered to be good. There do not appear to be any major oxygen depletion problems. The bay is open for commercial shellfish production except for a one mile radius around the mount of the Nueces River, a one mile radius around the outfall of the Portland Sewage Treatment Plant, and a 500 yard strip along the shoreline from Rincon Point to Avery Point.

The quality of the waters of Nueces Bay is to some extent dependent on the quantity and quality of the flow from the Nueces River. Although the impoundment of water in lakes for water supply has materially reduced the quantity of water reaching Nueces Bay, the quality of the water that reaches the bay is considered to be good.

The Texas State Department of Health reported the following water quality values for 11 stations in Nueces Bay which were sampled during July 1963:

	Temperature °F	MPN/100 ml	pH	Chlorides, ppm
Range	84 const.	0-2	7.6-7.8	25,200 - 28,000
Apparent Mode	84	0	7.7	26,000

Oso Bay

Approximately 9.8 MGD of effluents are discharged to Oso Bay by three municipal sewage treatment plants and one industrial plant. The total discharge is about 9.7 MGD of domestic effluent and 0.1 MGD of industrial effluent. The domestic sewage receives both primary and secondary treatment, while the industrial waste receives a lesser degree of treatment.

Oso Bay has historically been closed to commercial oyster production because the water is too shallow for establishing satisfactory reefs.

There have been complaints of odors in Oso Bay in the past but the odor problems appear to be under control at the present time. Unless proper precautions are taken, these problems may return and be magnified as population and industrial growth in the area continues.

The major problem in this shallow bay is the deficiency of fresh water inflow. The majority of the agricultural runoff of the Corpus Christi Bay area drains to Oso Bay. This runoff has led to heavy fertilization of the bay at times when rainfalls coincide with fertilization of the agricultural areas. It is believed that this sporadic fertilization led to accelerated growth and rapid die-off of aquatic plants and was the cause of most of the odor problems.

Elimination of individual household and industrial drains through the installation of sewer mains, improvements at the City of Corpus Christi Oso Sewage Treatment Plant, and reduction of agricultural use of lands by housing developments, appear to have brought the odor problem under control. As the growth in the area continues, some of the problems may return if vigilant control of effluents and runoff is not exercised on the water shed.

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